

APPENDIX C

TRAINING DEVICES

C-1 . PURPOSE

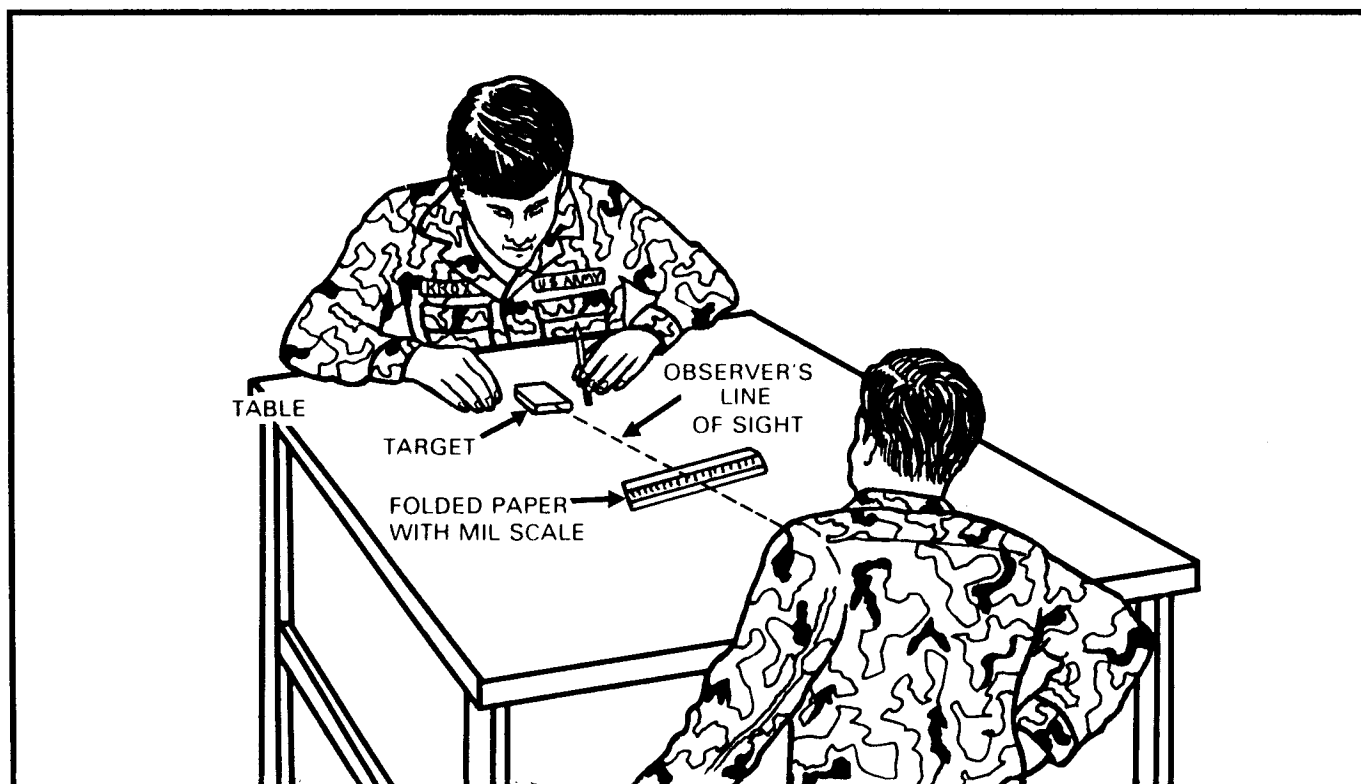
With the rising cost of equipment and ammunition and for the observer to be proficient at his job, more and more training must be done by using training devices. These devices range from the very simple to modern computerized systems.

C-2. MATCHBOX PROBLEM

Familiarity with procedures can be attained by firing simulated missions. A simple and effective method for practicing simulated missions is the "matchbox problem" (Figure C-1). This problem requires no equipment except a small object (such as a matchbox), a pencil, and a piece of paper on which a mil scale has been drawn to represent the scale of the reticle in the binoculars. Two or more persons should work together on these problems. The

matchbox, which represents the target, is placed on a table or on any convenient surface; and the mil scale is placed on the table in front of the target. The person acting as the observer faces the target and mil scale. He announces the call for fire and the OT distance to the second person, who stands beside the table and announces the message to observer and **SHOT**. After announcing **SHOT**, the person at the table places the top of a pencil on the table for a moment to simulate each burst. The observer determines the location of (spots) the burst(s) as over or short and determines the amount of deviation, in mils, in relation to the paper mil scale as seen from his position. He then determines and sends a correction to the other person. The other person again places the pencil on the table. This procedure is continued until the mission is completed. The person at the table critiques the mission and changes places with the person acting as the observer.

Figure C-1. MATCHBOX PROBLEM SETUP



C-3. 14.5-MM FIELD ARTILLERY TRAINER M31

a. The M31 field artillery trainer was designed to provide a low-cost but realistic trainer which allows FA units to train all personnel, including gun crews, fire direction personnel, forward observers, and survey crews, in the delivery of fire. The trainer also allows realistic training in geographical areas where full-scale artillery ranges are not available.

b. To get the maximum benefit from the M31 trainer, units must —

- Construct a miniature range.
- Develop a special 1:5,000-scale map with grid lines every 100 meters (1,000 decimeters) instead of 1,000 meters normally found on maps.
- Instruct personnel on the use of the equipment.

The technical manual for the trainer is TM 9-6920-361-13&P. Safety procedures are covered in AR 385-63.

c. When the observer is given a special map, as previously discussed, normal observer procedures, including the use of the OF fan, are used for determining the location of targets. The OT factor determined by the observer is based on thousands of decimeters rather than thousands of meters. For example, an OT distance of 2,800 decimeters (280 meters) would result in an OT factor of 3. The observer corrects for deviation by multiplying the measured deviation by the OT factor and announcing his corrections to the nearest 10 decimeters; for example, **RIGHT 60**. The bracketing method of adjusting for range is used by the observer. Caution should be used in establishing the range bracket. In many cases, the observer thinks his rounds are much closer to the target than they actually are. For example, if the rounds are 30 meters (300 decimeters) short of the target, the observer should announce **ADD 400** to obtain a range bracket.

C-4. TRAINING SET, FIRE OBSERVATION

a. The training set, fire observation (TSFO) was designed to permit realistic instruction to forward observers in the observation and adjustment of artillery fire and fire planning. The TSFO simulates the visual and sound effects that an FO can expect to experience at an OP when overlooking a typical battlefield. The TSFO can also be used for exercise planning, basic and advanced map reading, and terrain recognition training. The TSFO can simulate the effects of four 8-gun batteries, each equipped with 155-mm howitzers with a variety of ammunition types including HE/Q, HE/VT, HE/ti, smoke, and illum. A variety of targets can also be simulated. These include

machine guns, wheeled and tracked vehicles, and helicopters. The entire system can be operated by one person.

b. The TSFO simulates the visual and sound effects of artillery fire on terrain views projected on a classroom screen. A series of computer-controlled slide projectors provides the following:

- Terrain views as seen from a variety of OPs.
- Burst simulation of the number, type, location, and pattern of rounds called for in the call for fire.
- Target simulation as selected through the remote target control (RTC) box.

c. The sound system is controlled by the computer. It is programed to realistically portray the sounds typically generated by artillery rounds in flight and at the moment of impact. The sound level may be controlled by the operator to realistically tailor the sound to the size of the classroom and number of observers being instructed.

d. The TSFO can simulate day and night battlefield operations as well as visual characteristics of smoke and illuminating ammunition, including the effects of drift caused by wind speed and direction. The TSFO consists of the following main units:

- Projection screen.
- Projector stand.
- Operator's console.
- Observer facilities.

C-5. TSFO-G/VLLD SIMULATION ENHANCEMENT

The TSFO-G/VLLD enhancement is a replica of a tactical G/VLLD mounted in a TSFO facility. It uses a high-intensity light instead of laser components and interfaces directly with the TSFO screen. This device is used to train all critical tasks. The TSFO-G/VLLD uses existing G/VLLD-trainer tripods and traversing units.

C-6. LASER TRAINING KIT

a. Laser-safe ranges are needed to train G/VLLD operators. Areas where target ranging and laser designation may occur often are not available or practical for sustainment training with the AN/TVQ-2 G/VLLD. For this reason, the laser training kit was developed. It consists of an attenuator filter assembly and a laser inhibit (shorting) plug. The kit is part of the basic issue items in TM 9-1260-477-12.

b. The attenuator filter assembly is mounted with the glass filter placed over the laser window and the switch cover placed over the DES-RNG1-RNG2 switch. The attenuator filter assembly prevents the use of the designate mode and reduces the laser output power, thus reducing the laser hazard area.

c. The laser inhibit (shorting) plug is mounted on the left side of the G/VLLD to prevent the emission of laser energy. Thus, the G/VLLD operator can track a target anywhere and simulate designation without the hazard of actually firing a laser in the range finding mode. Target direction and vertical angle are displayed in the eyepiece. Since no target distance is determined, range is displayed as 9760.

WARNING

Even when using the attenuator filter, a potential eye hazard exists. Accidental firing may occur if the plug is not properly installed or if it is damaged. Always assume the laser is dangerous.

C-7. HELLFIRE GROUND SUPPORT SYSTEM

a. The Hellfire ground support system (HGSS) is a simulator for multiple integrated laser engagement system (MILES) air-ground engagement exercises. The HGSS is a component of the air-ground engagement simulation (AGES) II.

b. The HGSS is designed as a direct replacement for the G/VLLD for training purposes. It has a laser optical path and a visual optical path. The HGSS accurately duplicates the interfaces (mechanical, electrical, and optical) and the physical shape, size, and weight of the G/VLLD LD/R. It simulates, for MILES-AGES purposes, the offensive (range finding and designation) and vulnerability characteristics of the G/VLLD LD/R.

c. The HGSS supports force-on-force exercises at the Army combat training centers (National Training Center, Combat Maneuver Training Center, and Joint Readiness Training Center) and initial training at the USAFAS.

C-8. COMBINED ARMS TEAM INTEGRATED EVALUATION SYSTEM

a. The combined arms team integrated evaluation system (CATIES) is designed to realistically simulate the effects of indirect fire and, through integration with the MILES, to provide training on how to react to indirect fire.

b. The CATIES consists of the following components:

- The master control station (MCS) consists of a microcomputer and the necessary communications equipment to link with unit fire direction and fire support elements.
- The receiver-transmitter device (RTD) consists of a microprocessor, an antenna, cabling, and an auxiliary communications device.
- The player detector device/vehicle detector device (PDD/VDD) is a sensor on a soldier or a vehicle and is the link to MILES.

c. The basis of issue is one set to the National Training Center at Fort Irwin, California.

C-9. OBSERVER TRAINING FOR NONARTILLERY PERSONNEL

a. Proficiency as an observer requires much experience. It is required only of those whose primary duties include calling for and adjusting fires. However, all personnel should be able to take at least the minimum action required to get fire on a target. This includes all soldiers, from the combat arms soldier on the forward line of own troops (FLOT) to the DISCOM soldier far in the rear who may become involved in rear area combat operations. This manual provides the information necessary to train all personnel in the basics of observed fire procedures.

b. In most cases, nonartillery units are unable to provide live-fire training for their personnel. There are several alternatives that can provide excellent training opportunities.

(1) The first action should be to ask for the help of local artillery units and mortar sections. In most cases, these units will be happy to give expert instruction as time permits. It is imperative that the soldier learn the call for fire and the basics of adjustment before going to the field.

(2) Personnel may observe live fire from an OP set up near the artillery or mortar unit OP. From there, personnel can practice spotting and making corrections. To get the maximum training from this environment, a qualified instructor must be present.

(3) In some areas, a 14.5-mm subcaliber range is available. These ranges provide an excellent opportunity for realistic observer training without the high cost of artillery ammunition.

(4) Artillery units have training devices such as those described in this appendix. The use of these devices by

qualified instructors or operators provides excellent instruction. The matchbox device described in paragraph C-2 may be setup and used by any unit.

c. Keep in mind that you are not trying to make every soldier an expert observer, but every soldier should be able to call for fire support when needed.
